Where's The Launch?

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Overview

Changing Environment

Launch Vehicles

Mission Manifests

New Options

Conclusion

Changing Environment

The Launch Vehicle planning environment has changed significantly

Atlas V – 12 months standard from contract signing to launch. Advertises a 4 month capability

EELV – program calls for 24 month standard from "authority to proceed" to launch

Falcon – 8 month nominal SpaceX timeline

Changing Environment

Potential policy changes for DoD mission

Downward directed from the "top" - Dr. Ron Sega, Department of Defense executive agent for space and under secretary of the Air Force

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Capacity for secondary payloads could become a standard part of the launch vehicle block purchase

Launch Vehicles

Most small launch vehicles do not have a GTO capability

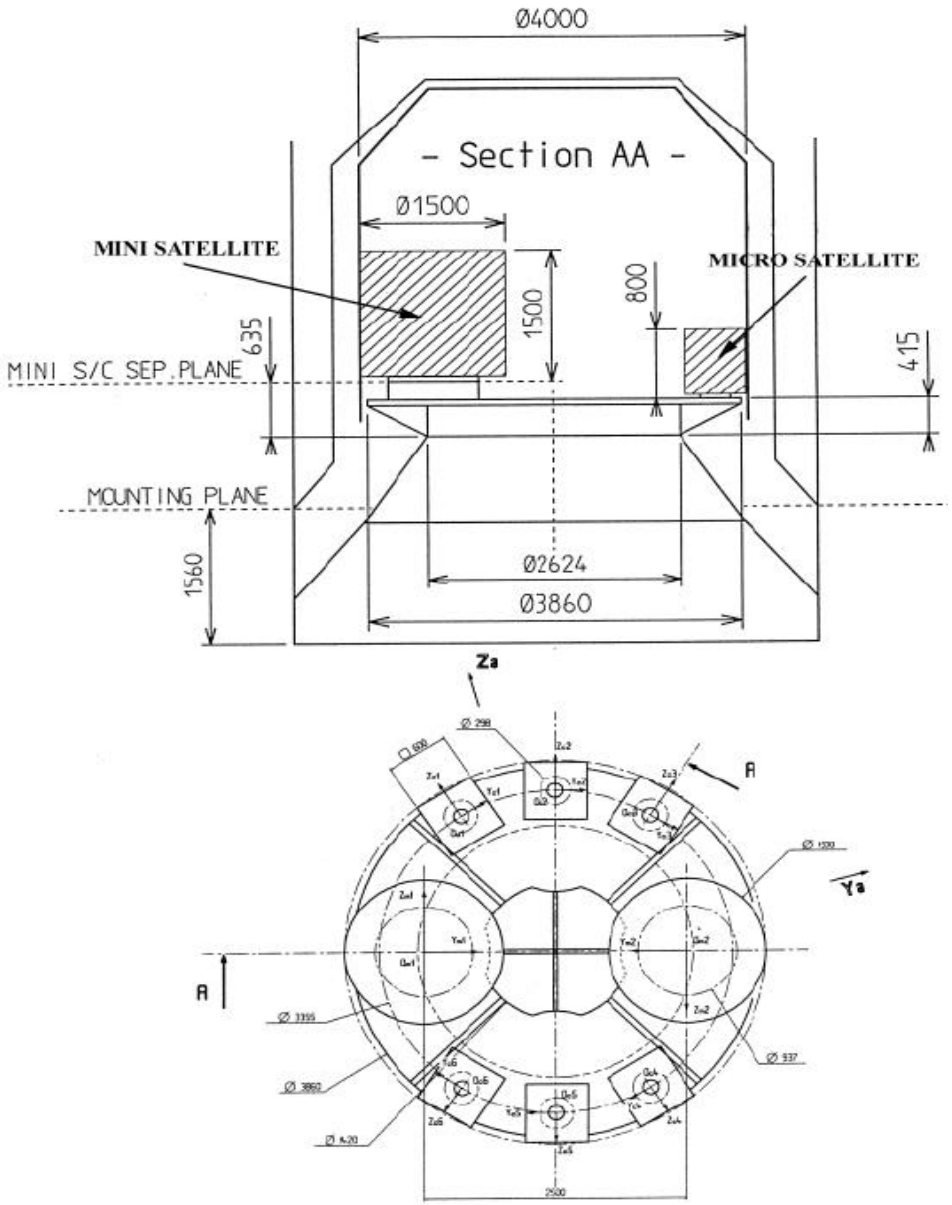
Leaves the larger launch vehicles

Ariane V	Falcon 9 *
Atlas V	Proton *
Delta II	Sea Launch *
Delta IV	* No published secondary capability

Launch Vehicles – Ariane V

Ariane V - ASAP5

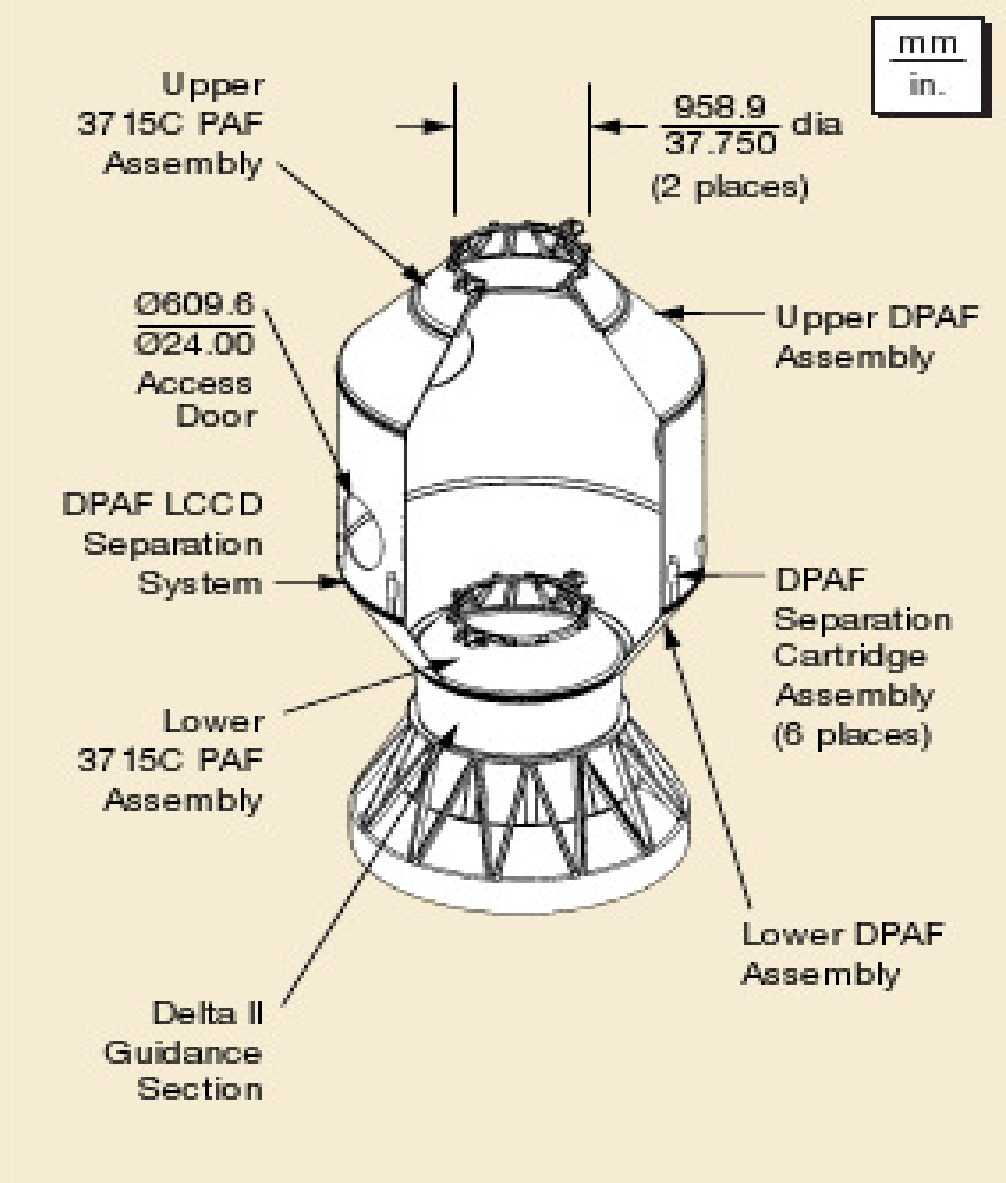
- Eagle fits
- P3E would need to have the 2m antennas stowed



Launch Vehicles – Delta II

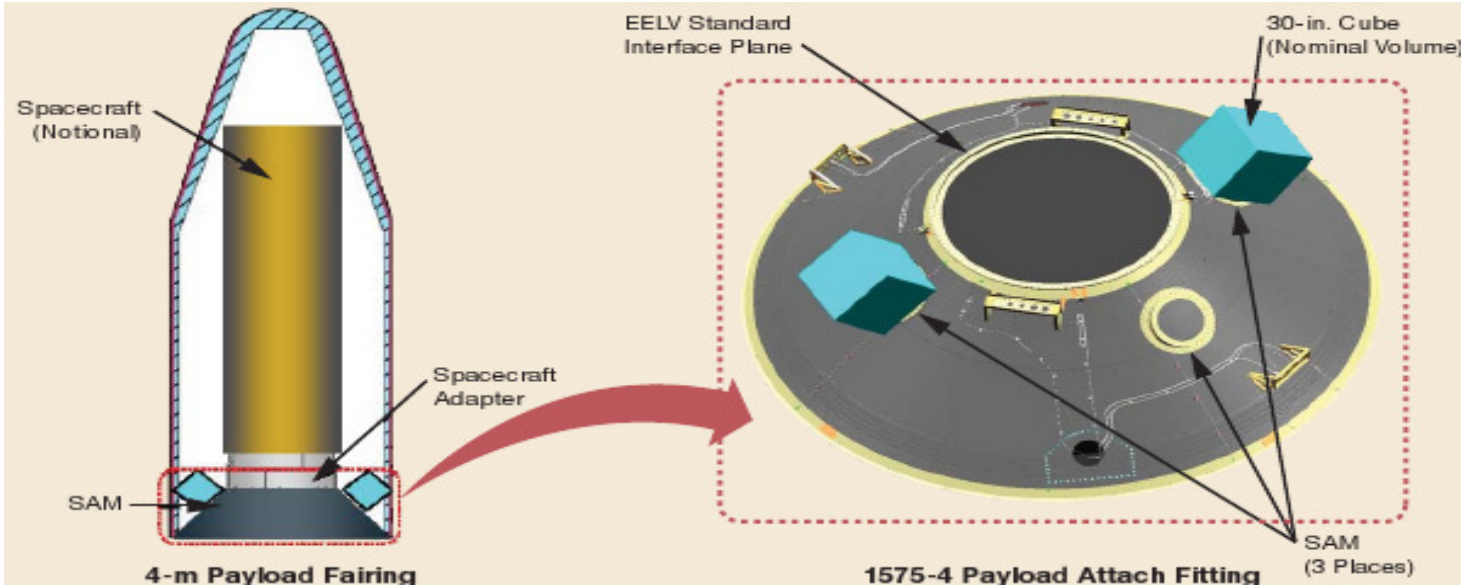
Delta II - DPAF

- Eagle fits
- P3E would need to have the 2m antennas stowed
- Looking for candidate missions



Launch Vehicles – Delta IV

Delta IV – Secondary Attach Module



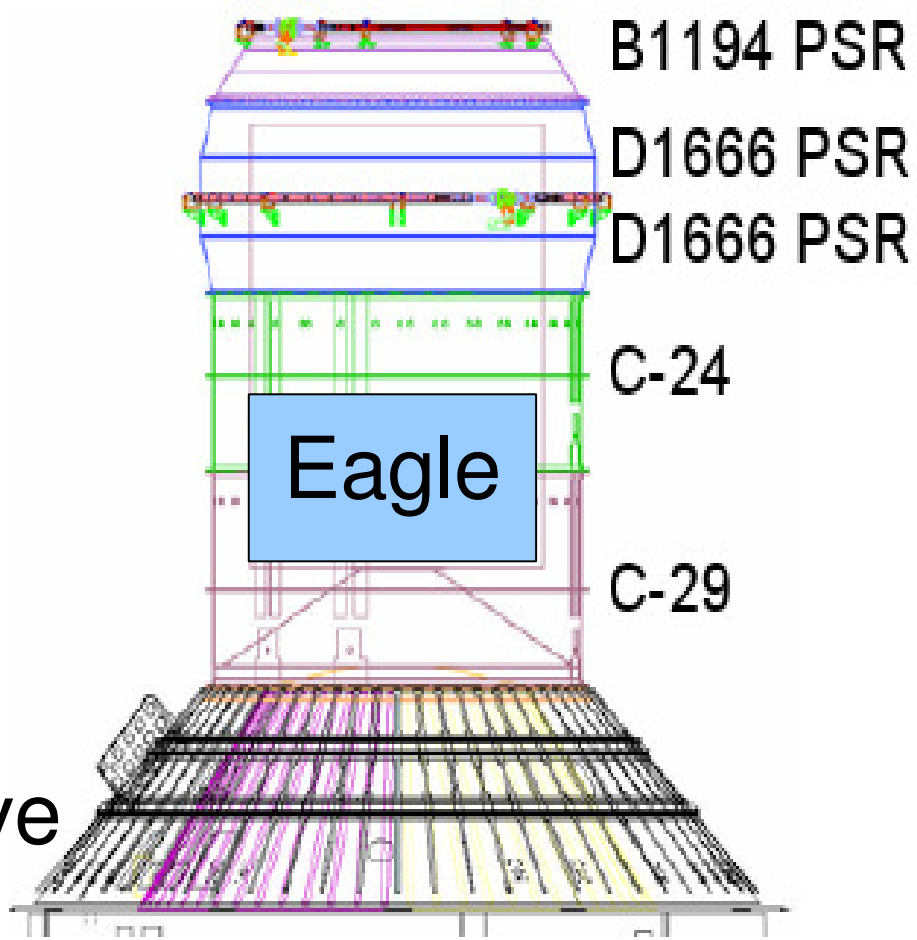
- Has not flown

- Available volume too small for Eagle or P3E

Launch Vehicles – Atlas V

Atlas V – Internal Payload Carrier

- Uses existing qualified hardware
- Has not flown
- Eagle fits
- P3E would need to have 2m antennas stowed



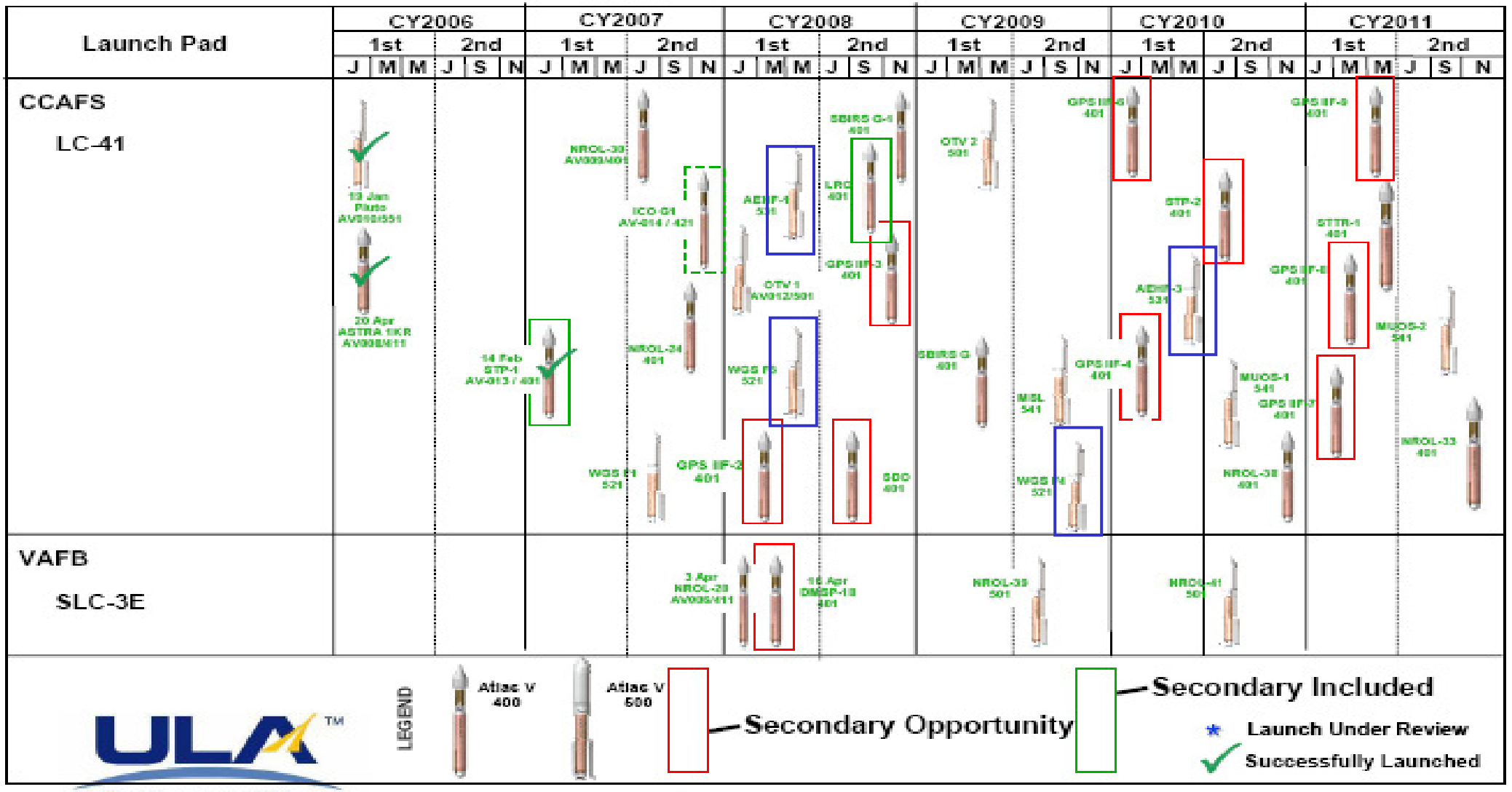
Mission Manifests

Key to secondary mission planning involves finding programs with excess capacity

- Look for programs building constellations
- AEHF - 5 satellites
  1000 lbs propellant excess
- Wideband Global Satcom - 6 satellites
  1500 lbs propellant excess

Mission Manifest

Atlas V Secondary Manifest Capability

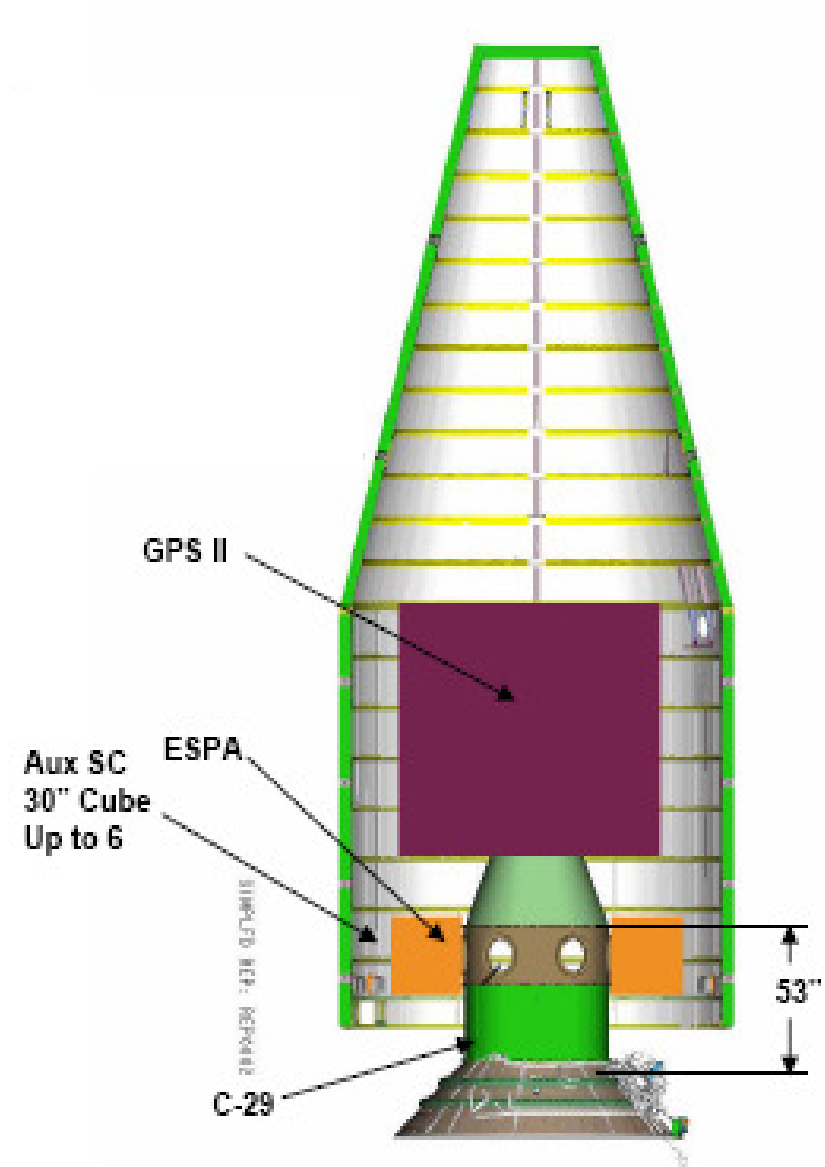


United Launch Alliance

New Options – GPS IIF

Performance Margin > 1500 lbs

- ESPA+C29 ~ 500 lbs
- Stack shown is 53”
- Max height 106”



New Options – GPS IIF

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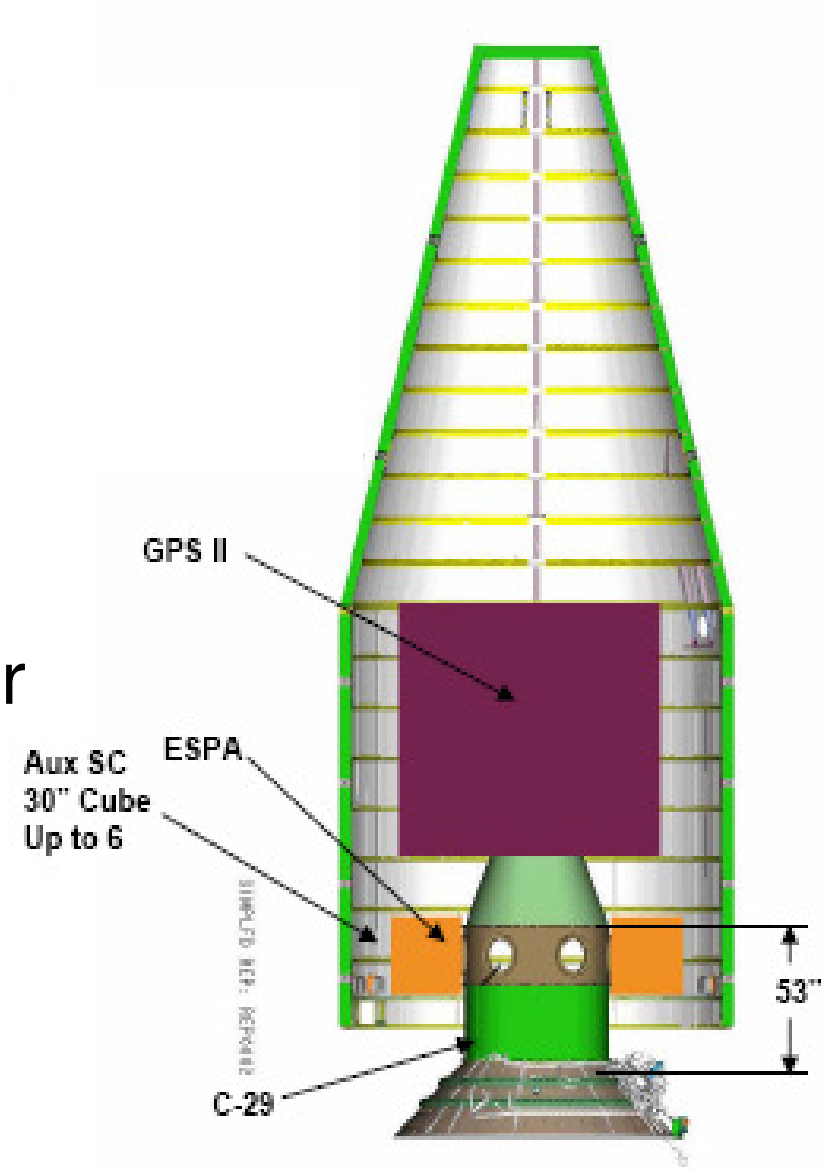
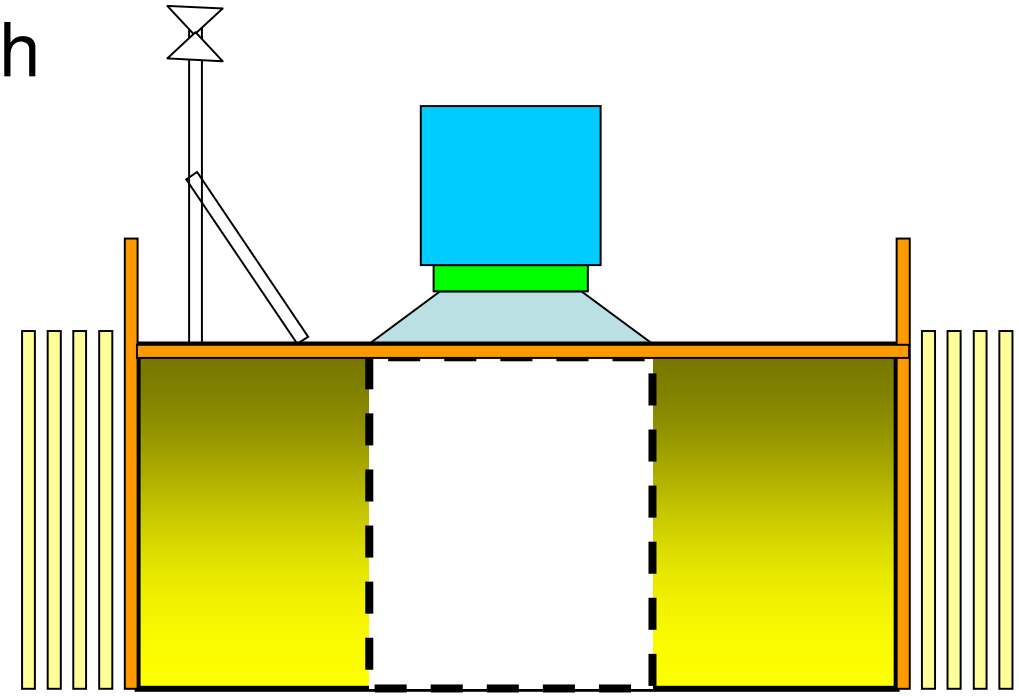
- GPS IIF launches to a circular GPS drift orbit
- 150 km above/below 12 hour GPS orbit
- Footprint and access durations comparable to P3



New Options – Georideshare

Satellite integrated onto the primary spacecraft

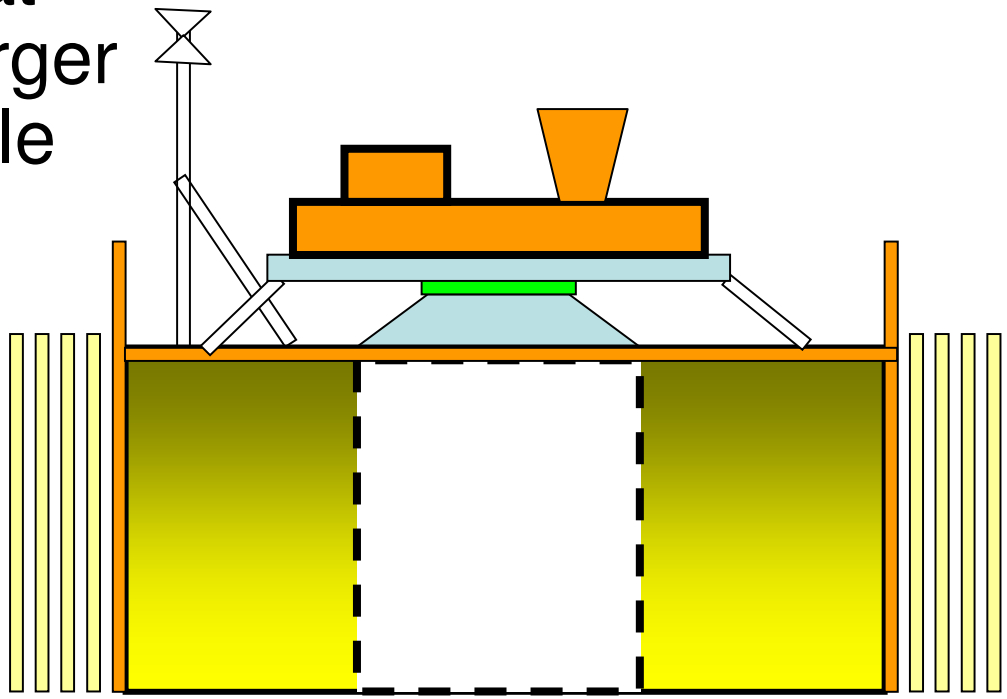
- Deploy in LEO, GTO,GEO
- Earlier deployments allow for more mass
- 2-3 flights per year
- Allows planning based on on spacecraft instead of launch vehicle schedules



New Options – Georideshare

Payload hosted by the primary spacecraft

- Space available on the nadir pointing face
- Power, attitude control provided by host
- Proven, conservative 15 year design life
- Available power margin at end of life is significantly larger than has ever been available to an AMSAT spacecraft



- Fullfills AMSAT's vision of 24/7 HEO satellite access

Conclusion

- The environment in which AMSAT operates is constantly changing

- The emerging trends suggest a very bright future for amateur satellites

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- To take advantage of these opportunities your support is needed **NOW!**